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Ideas and Inspiration for Planning a Dialogue-based Teaching Session at a PhD course

Report 5.2011

DTU Management Engineering

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March 2011

DTU Management Engineering
Department of Management Engineering

Ideas and Inspiration for Planning a Dialogue-based Teaching Session

"Mixed Methods Research"
at
42702 "Research and PhD Studies at DTU Management" (PhD course)

By:
Assistant Professor Christine Ipsen,
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Planning and teaching at “Research and PhD Studies at DTU Management”

The purpose of this report is to inspire other peers at DTU to carry out dialogue-based teaching by sharing ideas and inspiration from the PhD course “Research and PhD Studies at DTU Management”.

The report outlines reflections and the design process of the PhD course “Research and PhD Studies at DTU Management Engineering”, and in particular a teaching session on “Mixed Methods Research”, using a dialogue-based teaching approach. It also describes the use and benefits of using peer coaching in the planning process of a teaching session.

This report gives insight into the design process, teaching experience, and some related reflections. It is hoped that all in all it can serve as inspiration in the development of new PhD student courses at DTU as well as more active teaching.

1. Introduction to the PhD course: “Research and PhD Studies at DTU Management Engineering”

DTU Management offers a PhD course, “Research and PhD Studies at DTU Management”, twice a year. It runs for four days in a row, corresponding to 2.5 ECTS points. The course is targeted PhD students at the department and is mandatory. The intention is that they participate during the first six months of their project. This means that they comprise a very heterogeneous group with different expectations. They also have different experiences regarding reflections about and use of research methods, especially in relation to research design.

For the teachers responsible for the course, it is of course a challenge to make the course's relevance clear to all the participants whatever their research topic, and also make them understand that by participating actively, their learning process and outcome can actually improve the quality of their research. But we assume that the PhD students are intellectually curious, and that as part of a reflected research environment, they understand the course's meaning and usefulness.

As the participants are all new in their job as a PhD student we do not require or expect previous knowledge to attend the course.

The aim of the course is to introduce the PhD students at our department to scientific research in relation to studies of technology and social systems as well as some of the general challenges they will face during their PhD studies; develop their knowledge about the question of what is science; and acquaint them with relevant research tools. The course also aims to develop knowledge about life as a PhD student.

Overall, the participants should develop the competence to see themselves as part of academia and the research community, and understand the related challenges. They should also develop an understanding of their place in DTU Management, its research profile, research practice, staff and faculty.

This course, in combination with the mandatory courses in Teaching and Learning for PhD Students, will train the participants for central tasks related to working in academia.

The following themes are thus addressed:

- Philosophy of Science – Science of Engineering (special characteristics of engineering science)
- Methodology and tools in research
- Developing the competencies needed
- Carrier patterns for a PhD
- The research process and the PhD study process
- Management of literature
- Trends in research policy

The course was originally initiated by the head of the department, Per L. Jensen (PLJ). He had witnessed over the years how PhD students found it difficult to adjust to the academic process. It was time consuming and caused much frustration. It thus became evident that the department's PhD students needed some basic knowledge of philosophy of science and an increased understanding of their own research project in relation to the research strategy of the department.

The diagram below (see Figure 1) tries to illustrate the aim of the PhD course: to increase the learning curve by giving the PhD student a better understanding faster.

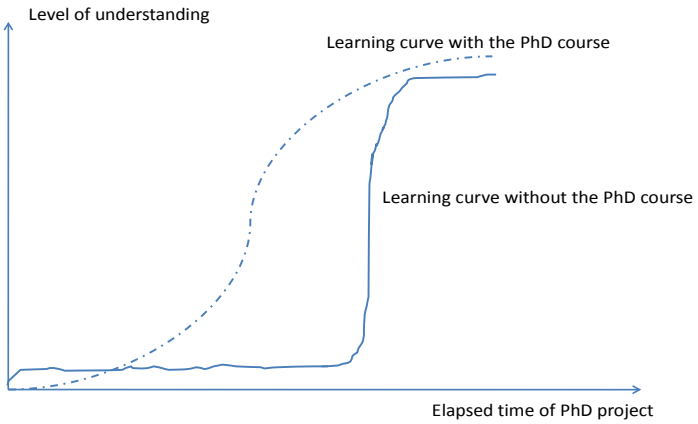


Figure 1. Illustration of learning curve with or without the PhD course

Faster in this case means early in the PhD project, preferably within the first six months. This leads to the prerequisites for the course. There are none; the students are simply asked to participate actively and reflect upon the themes and subjects presented. Due to the length of the course and level of prerequisites, the learning objectives are at the lower end of Bloom's taxonomy.

,The course was held for the first time in autumn 2008 and is now offered two times every year. Table 1 presents an overview of the course and how it has developed.

	E08	F09	E09	F10	E10
Responsible for course	Rikke Seim + PLJ	Chip/PLJ	Chip/PLJ	Chip/PLJ	Chip/PLJ
ECTS Points	1½ (3 days)	2½ (4 days)	2½ (4 days)	2½ (4 days)	2½ (4 days)
Grades	Credit/No Credit	7-step scale	7-step scale	Credit/No Credit	Credit/No Credit
No. of students	10	9	12	13	??
Comments	Pilot course. Held for the first time. There is no assignment at the end.	Points, curriculum and number of days increased in order to meet the need for learning and absorption. A final assignment forms the basis for the final grade. (7-step scale)	E09 like F09 with some small adjustments.	We decide to go back to Credit/No credit. Minor changes are made based on the students' needs. An example is the session about mixed methods research.	The need is evident for at new teaching session on systems design and construction.

Table 1. Overview of course development

Prior to the course, the participants are all asked to write a small presentation of their project and to study the curriculum. After the course, they deliver a developed presentation in which they have integrated relevant models from the presentations and course curriculum. The students are assessed on the basis of their participation and their written presentation.

Since the number of participants varies between 8 and 15, the teaching methods chosen are a combination of group-based teaching, dialogue and inductive teaching, depending on the subject. The teaching is very varied, and the atmosphere is pleasant.

Together with two colleagues, I am in charge of planning the course and participate all four days. Planning and participation covers: course administration, designing the course and the content, teaching various sessions, and assessment of the student assignments. The teaching load is shared by a group of three, combined with several shorter presentations by other colleagues from the department.

2. Learning objectives and analysis of the course subject

Using Bloom's taxonomy as a tool to categorize the learning objectives, it is evident that these objectives match the lower part of the taxonomy.

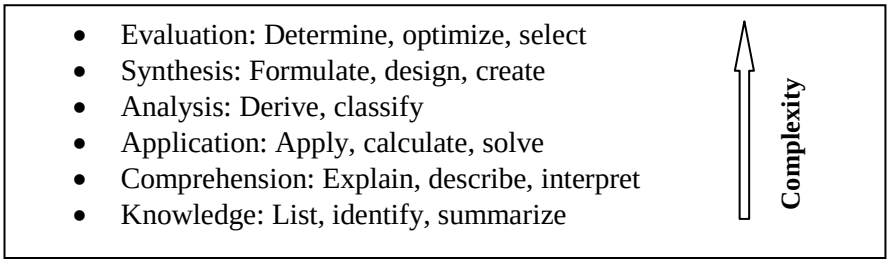


Figure 2. Blooms taxonomy – levels of learning (Felder and Brent, 2004)

Due to the course's length (4 days) and the fact that the students are largely without prerequisites related to the core elements, we cannot expect students to reach any higher level in the taxonomy. Our hope and expectation is that the students will be able to analyse, synthesize and evaluate their own research (the top of the taxonomy) later in their PhD project, but not at this early stage. After completing this course, the participants should be able to:

- **Identify** basic steps in scientific work
- **Identify** and choose basic approaches to scientific studies
- **Apply** basic tools in scientific work
- **Identify** and choose among different methods for scientific studies
- **Describe** their article strategy or present a thorough outline for their first article
- **Perform** a peer review within the field of socio-technical studies
- **Participate** in establishing research strategies in the light of present discussion of research policy
- **Present** a carrier strategy based on a PhD study

The learning objectives for this course are defined on the premise that if the course's learning objectives, content etc. are not aligned with the department's research fields and environments, it will be difficult for the participants to use what they have learned, and they will probably lack motivation. Therefore, good knowledge of the department's research areas is important when defining the learning objectives.

Core elements

The learning objectives should support the students in learning the core elements, which in this course consist of the following:

- Philosophy of Science for Engineers (at DTU Management)
- Introduction to research, focusing on the situation of the PhD students
- General and practical research tools
- Research scope at DTU and in Denmark

Main challenges

As Philosophy of Science is a subject about which many have opinions, and with which engineers are typically unfamiliar, our expectation is that the students will find this subject difficult and/or irrelevant. We therefore make a strong effort to explain why this course is highly relevant for them as young researchers at a technical university. By stressing the importance and benefits to be gained, we hope to inspire the participants to become more familiar with the subjects presented.

3. The overall learning question

As the core of the overall learning question for the course and the specific teaching session, I have chosen to focus on combining dialogue and activation. My experience is that using the deductive method would not have the desired impact. Working with and discussing the participants' own

research design will induce more motivation for participation and thus reflection about their own work and scientific position, which is what this course is all about.
Therefore, the learning question can be formulated like this:

How do we/I support new reflections and learning
in relation to the participants' own research and research design,
using a dialogue-based approach and activation?

Supportive working and teaching conditions are obviously a cornerstone of good teaching and development of new learning styles, sessions and courses. If these conditions are present, I believe the students' learning and my motivation will be secured.

4. Analysis and planning of the course

The lecture plan can be found in the appendix and is the main result of the macro-planning of the course. The table below is a summary of the detailed plan (spring 2010) and illustrates how the content of the core elements is evenly distributed over the 4 days. This design has been chosen, because it is our experience that the subjects and core elements can be quite difficult to grasp and seem very abstract.

In order to make sure that the elements have the chance to settle and the students can assume ownership of the course, the elements are thus presented over several days to create variation. An alternative could be one theme every day, but as the students have very different backgrounds and projects, we fear that it would be difficult to motivate and active all the students at the same time.

Also, in order to support the enthusiasm which we know the students have when they start their project, and use it as a dynamo for their future work, we have decided to vary the content each day, without making it confusing.

Although some of the themes could seem more relevant than others, we have chosen to give them equal attention in terms of time. The teaching method varies a lot however, depending on the subject. The general and practical tools are very hands-on, whereas the presentation of the research scope is deductive. The other elements can be categorized as inductive. Our goal is that the sessions involve and activate the students as much as possible. This is also what we tell those we ask to make presentations during the course.

DAY	SUBJECTS
Tuesday, Day 1	**1. Research at DTU Management** **2. Philosophy of Science (Part 1)** **3. Information Retrieval**
Wednesday, Day 2	**1. Philosophy of Science (Part 2)** **2. Mixed Methods Research** **3. Evaluating Research** **4. Literature Management**
Thursday, Day 3	**1. The PhD Rollercoaster** **2. Cooperation in Research** **3. Science of Engineering** **4. Introduction to the Final Assignment**
Friday, Day 4	**1. Writing a Paper** **2. PhD Careers** **3. Research at DTU** **4. Course Evaluation**

Inspired by the UDTU course, we decided to introduce the concept of feedback persons in order to acquire a good idea of how the course was received and also to receive feedback on each of the teaching sessions. The aim was to use the feedback to revise the course program for the following days if possible, or at least the coming semester.

The feedback persons volunteered at the beginning of the course, and two of them gave their feedback to me each afternoon. The following morning, I presented the major themes addressed to the rest of the students and outlined our response.

4.1 The students' capabilities and the pre-test

As stated above, it is my experience that the students have limited knowledge on the subjects presented in the course. The purpose of a pre-test was thus to assess the students' knowledge about the subjects. Ideally, the outcome could provide an opportunity for adjustments.

However, since this course runs for four consecutive days, it is difficult to make any great changes. On the other hand, the pre-test provides me and the other teachers with a good picture of what we can expect from each student during the course, and also in the final assignment and consequently in our assessments. The outcome of the test also provides basic knowledge for preparation of the subsequent course.

Based on a peer-coaching session with two colleagues I had decided to design the pre-test as a dialogue-based group test. The outcome of the test was clear. When asked the question, *"What do you know about themes like Philosophy of Science for Engineers, the Department's Strategy, Life as a PhD Student, and Research Tools?"* some students nodded and others raised their hands, but most were silent. Those who indicated that they had prior knowledge were then asked how and where they had become acquainted with these subjects. Their knowledge came from prior courses and paper writing. When we asked more specifically, *"Have you heard of the term quantitative and qualitative research?"* less the 50 percent said yes. Only a few were acquainted with the term "research question and design".

Based on the result of this little test, I therefore concluded that the content of the course was appropriate and very relevant and could thus provide them with core knowledge on being a researcher. It also provided the group of teachers with an awareness of the level of our expectancy, and also that the focus of our teaching should be on the application of the subjects presented in order to secure the students' learning during the course.

With reference to the four dichotomous dimensions (Felder and Silverman 1988), I found that the students represent a combination of sensing learners, meaning that they are concretely and practically oriented towards facts and procedures as well as the visual and reflective and sequential (linear, orderly, tend to learn in small incremental steps). Consequently, our teaching style must be shaped according to the way they learn.

A colleague took notes during the group test, so that I could focus on the dialogue with the students.

4.2 Assessment method

Prior to the course, the students hand in a presentation of their project to give us an idea of the range of themes in the projects.

After the course, they hand in a new assignment in which they present their reflections based on the themes, models and theories presented during the course. The assignment together with their participation during the course forms the basis for the assessment of the students' learning. In addition, it is expected that the students participate in more than 80 percent of the scheduled plan.

The length of the assignment is about 5-10 pages and should relate their project to the curriculum. In practice, we ask them to:

- present their thoughts regarding their own study, integrating the models, theories, tools, methods etc. presented in the course
- describe how they see the possibilities for their own situation and project to contribute to the department's research strategy, aside from their expectations for their PhD study
- include a thorough outline and plan for their articles/or first article

By describing their projects utilizing the presented concepts and terms, the assignment should thus reflect their ability to identify basic steps in scientific work and present arguments as to why they have chosen basic approaches to scientific studies. It should also illustrate their ability to apply basic tools in scientific work and identify the different methods they are working with. And finally, it should contain a description of their article strategy or a thorough outline for their first article. The assignment is graded: Credit or No Credit.

4.3 Teaching material

The teaching material consists of several books and scientific articles. As the course embraces many fields, it is not possible to teach on the basis of one textbook. Most of the curriculum is necessary to have studied whereas others texts are self-tuition. In addition to the various texts, some of the presentations are also regarded as part of the course material.

The intention of this design is to support learning with basic literature that also will be of relevance in their future work. Before commencing the course, the lecture plan is uploaded on CampusNet, and prior to that the curriculum is forwarded to the students together with a welcome note. The latter includes some relevant information about the course, deadlines etc.

4.4 Reflections along the way

During the course and when evaluating it for the last two semesters, we have discussed with the participants whether the learning objectives are adequate. As a result of the evaluation of the course (autumn 2009), we decided to increase focus on writing articles to peer-reviewed journals. Therefore, one of the learning objectives was reformulated to: *"The student should be able to outline the content of a future article or the article strategy for the PhD period."* To align the assessment with the learning objectives, the students are now asked to describe their article strategy or present a thorough outline for their first article.

Another issue that came up several times is assessment techniques. At present, the students hand in an assignment in which they integrate the course curriculum with their project and thus present their level of learning. The question is whether this technique is suitable and gives a good picture of what has been learned. Since we have not discovered a more suitable technique, we have chosen to continue this practice.

Finally, we have received the comment on several occasions that the course does not embrace those students who are working with construction of systems or systems design. We have therefore developed a new teaching session on this subject, namely "Aligning Models and User Domains". Since construction of systems is a fairly unknown area for half of the students and the other half has a very varied understanding of the subject, we have chosen to formulate the learning objectives according to the lower end of the taxonomy.

5. Analysis and planning of one teaching session - MMR

Based on the previous student assignments we received, it was evident that the majority of the PhD students at our department uses more than one method during their project and/or work across scientific disciplines. It is also evident that they find it difficult to explain why they chose to work

with several methods. Is it to increase data richness? To validate the data? Or for some other reason?

Consequently, we decided to introduce a teaching session on Mixed Methods Research the following semester. We did not discuss this with the students but were confident that the subject was of key importance to most of them. It was introduced for the first time in the spring 2010.

5.1. The micro-plan

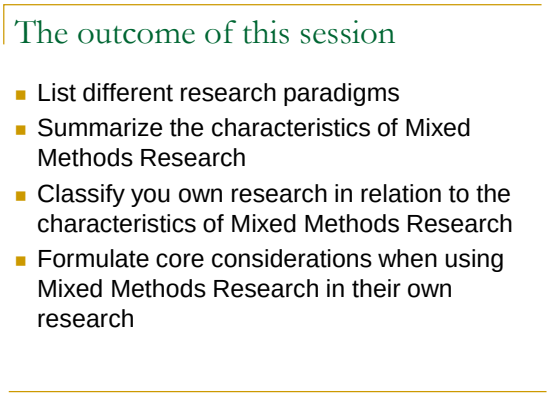
As stated above, the purpose of the session on Mixed Methods Research (MMR) was to introduce the students to the concept and research implications of combining research methods. It took place on the second day of the course, just after Philosophy of Science for Engineers had been introduced, and was scheduled to take one hour. The session was placed here so that the students would have a more similar or equal understanding of some of the subjects that are prerequisites for discussing MMR. Prior to the teaching session, a peer-coaching session took place. All in all, the micro-planning took place in two rounds.

Round 1

Since my knowledge of Mixed Methods Research was limited, I needed to become better acquainted with the subject in order to plan the session. After studying three papers, I tried to define the learning objectives.

Using Bloom's Taxonomy of Educational Objectives, and with some idea of the (expected) student capabilities, I decided to focus on the middle part of the taxonomy. I also made this choice because I wanted the students to become acquainted with the subject and maybe be able to classify their own research by using its concepts and models, since this would be of great importance in the future.

The following statements of intended student learning outcomes were formulated as follows:



The micro-planning of the session was based on my prior teaching experience and the input and learning experiences from the UDTU course. I thus had a list of themes – my personal toolbox, so to speak – that I wished to include in the session:

- A good informative slide takes around three minutes. If overloaded, it takes longer.
- It is difficult to concentrate for more than 15-16 minutes (also termed critical time); there should therefore be some kind of shift – for example an exercise, new media etc.
- The size of the class is perfect for inductive and dialogue-based teaching.
- Inductive teaching is much more active and integrating and – from my point of view – much more fun.

However, along the way, I felt a bit uncomfortable working with this teaching session. Having reflected about this a bit, it became clear to me that as I was too unfamiliar with the subject. I had to study the subject as a beginner, understand and communicate it, and combined with the limited time, all this made me uncertain about whether I would be able to teach with authenticity and authority.

As a result, I planned a deductive presentation of the subject. I would proceed from a presentation of the general principles and theories to the specific applications, combined with small exercises and dialogue.

Problem-based teaching of MMR might have been considered preferable by some, since most engineering students prefer to learn through the process of working with problems (Felder and Brent, 2004). However, since I was aware that the application of MMR would most likely be relevant later in the students' PhD projects, and since only one session was to focus on this subject, I decided to present the subject in a more traditional deductive manner.

Peer-coaching about the micro-plan

When my presentation was almost completed and the micro-plan for the session was more or less in place, I was quite content with my micro-plan and invited two of my peers to my office. I expected the peer-coaching session to go well. Although I had the feeling that I was not on top of the subject, I thought it was only a matter of time.

First, I presented my slides to my peers, and along the way, they asked clarifying questions, which were great input for sharpening my slides. The questions for further development were asked after the presentation:

Q1. *What is your intention with this presentation? To present the students with a 1:1 description of the curriculum, or your interpretation? It seems like you just want to transfer to them what you have in your head.*

A1. That was a very good question and put the spotlight on what turned out to be my greatest challenge. During our talk, it became clear that, due to my feeling of insecurity about the subject, the picture I had in my head was a 1:1 transfer of the curriculum. I had not reached the point of being familiar enough with the subject that I could 'lift myself up' above it. I was at the lower end of the taxonomy, so to speak. And this was also why in practice, I had chosen the deductive teaching method – it seemed to be the easiest way.

Our discussion made it clear that I could have a different attitude despite my 'insufficient' knowledge. I thus decided on a more inductive opening of the session. I would ask the students a question about the relevance of the subject (MMR). The aim of my teaching was no longer to present the students with a 1:1 description of the curriculum, but instead rather give them an understanding of my interpretation and application of the subject.

Q2. *It seems very dry (a lot of text on the slide) - why? Couldn't you do something else?*

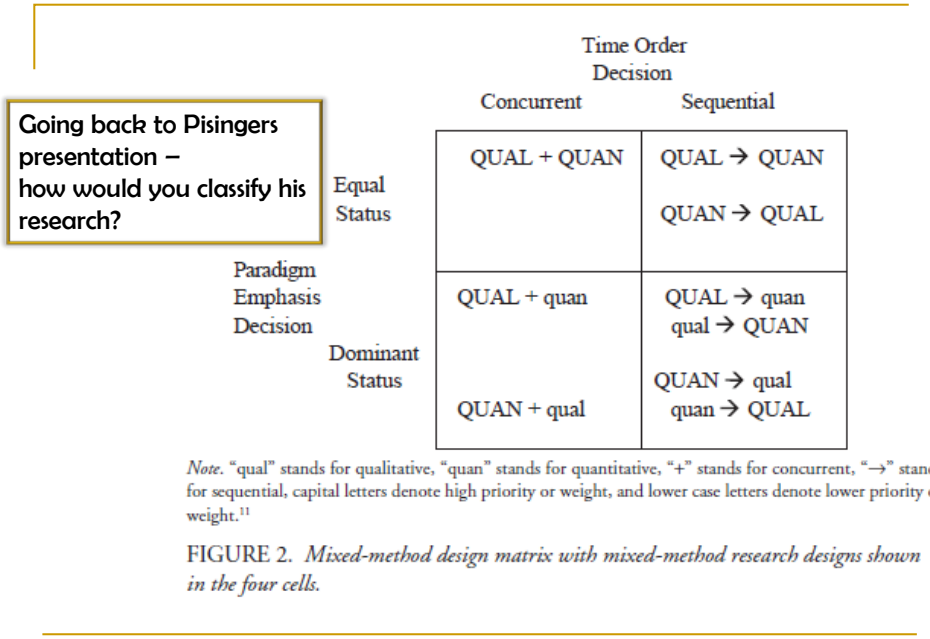
A2. Again, this very good question made me realize that I used my slides as very detailed notes. My reflections made it clear that I had two choices: I could either reduce the level of information or use different media or learning tools – for example, a whiteboard or flip-over, more examples, or maybe a buzz exercise for the students. I decided to use both.

Round 2

After the peer-coaching, I decided to take a different teaching approach and returned to the dialogue-based teaching style that I basically prefer. I also decided to change some of my slides according to peer comments, and my plan was to discuss the content with the students. As a result the micro-plan looked like this:

Time	Activity	Purpose
11.00	What's the aim of mixing methods	Dialogue-based introduction. Using the students' own experience as a starting point for the session Followed by a presentation of some different explanations and answers
11.12	Presentation of the learning objectives /outcome of the session	
11.15	Presentation of the understandings and characteristics of MMR	Introduction to new topics
11.30	Buzz exercise in groups. Using a specific model/matrix – how would you classify his research? (See figure below.)	Dialogue-based teaching. Supporting the students to classify research using the models presented
11.45	Presentation of other research design at the department	To illustrate the point
11.50	Plenum discussion about the strengths and weaknesses of mixing models	To create awareness and be able to formulate considerations regarding their own research
11.55	Plenum discussion – Where do you place yourself?	To create awareness and make the students reflect actively about their own research
	Conclusion and further reading	Since this was an introductory, session further reading was suggested.

Table 2. Micro-plan for the teaching session on MMR



Note. "qual" stands for qualitative, "quan" stands for quantitative, "+" stands for concurrent, "→" stands for sequential, capital letters denote high priority or weight, and lower case letters denote lower priority or weight.[11]

FIGURE 2. *Mixed-method design matrix with mixed-method research designs shown in the four cells.*

Figure 3. Example of small buzz exercise integrating previous presentations with the presented model

6. Discussion on the peer-coaching

Even though the peer-coaching sessions addressed two different issues, I comment on them together.

I find the whole idea of peer coaching very valuable, especially as it provides the opportunity to discuss the micro-plan and learning objectives with peers from other fields. It thus becomes a discussion of teaching style etc. and not so much content.

It was very inspiring and educational to see the plan I had made through their eyes, primarily because they could point out issues that were likely to be problematic for the students. It also helped me to see that my role as a teacher can vary, and that I do not need to know every detail on a subject in order to be a good teacher. Finally, our experiences and styles are different, so together we can draw on a larger pool of knowledge regarding how a teaching session can be addressed.

7. My impressions of the teaching sequence - MMR

After the teaching session, I was in no doubt that the topic has its relevance for this course. Although it is not evident to all the students, the majority is mixing methods in their projects and this has implications for their results.

The teaching approach (dialogue and induction) was also quite suitable, although it sometimes seemed a bit confusing to juggle with several teaching tools. There were some good discussions, and especially one table turned out to be a good point of reference. It could also be used to classify one of the earlier presentations made by a fellow colleague.

However, some of the students did not see the point in this subject and could not relate to it. Consequently, they could not see its relevance. On the other hand, it gave some students a deeper understanding of what they were doing, and that there actually are concepts and models that describe it.

8. Feedback from Peers

Immediately after the session, I received the feedback from my peers. On the positive side, they had the following to say:

- There was good variation during the session regarding tools and styles.
- There was also a good atmosphere in the room.
- It was good that I tried to have a dialogue with all students and not just one.
- It was good that I juggled with several teaching tools and media.
- And then it was good that I used anecdotes and examples to explain the models and theories.

They had of course also some comments for further reflection:

- It could be good to use fewer negations.
- It could be good to have less text on the slides.
- I should spend more time explaining the figures.
- For some slides, the speed slowed down. Try to maintain it.
- In the buzz exercise, one student was in focus – can I do it differently?
    - Use groups of three next time, and mark their position (project) on the table.
- Could the session be even more inductive and conclude with the table?
    - Is it necessary with the whole curriculum?
- It is not your responsibility that everybody understands everything – focus on the students who find the subject relevant.

During my peers' coaching prior to the teaching session, we had discussed whether the teaching approach should be deductive or inductive. During the teaching session it became clear that I started

with an inductive approach, trying via dialogue to address the relevance of MMR just as I had decided to do on the basis of the coaching session, and it went well. My peers observed, however, that as the session progressed, my teaching approach became more deductive, resembling large-class teaching. How come? What happened?

My response was simple. Due to time pressure, I decided I had to leave some of my slides the way they were, with a lot of text. Thus, I was caught in the '1:1 trap'. Instead of sticking to dialogue with the students, I began teaching in a traditional way. The lack of time became more critical, due to the student who had a tendency to talk a lot, thus taking a lot of the time.

I have also become aware that when I have the feeling of 'not being on top of a subject' or when things are new to me, I have a tendency to teach in a traditional manner. It feels a lot 'safer' although it actually requires that I must have a much deeper understanding of the topic.

9.Conclusion

I present above the PhD course that I teach and am in charge of. The focus is on the development of a new session on Mixed Methods Research, how it was designed and why. My reflections on the actual teaching session are also included, and last but not least, the outcome of the pre-test and the peer-coaching sessions.

As stated earlier, the overall learning question for the course and the specific teaching session included a mixture of dialogue-based teaching and activation. Thus, the learning question was formulated like this:

How do we/I support new reflections and learning
in relation to the participant's own research and research design,
using a dialogue-based approach and activation?

I am certain that we have chosen the right teaching method, even though some might say it takes longer time. However, in this particular course, the learning outcome would decrease if a purely deductive approach were chosen. The problem with our approach is mainly that the students comprise a very heterogeneous group, since the participants have very different expectations and experience with reflective thinking and especially with applying it in relation to their research design. This is something we must continuously focus on.

I am also aware of that their reflections, learning and improved research skills are not entirely dependent on my effort and the themes we teach. As part of a research practice in which each participant has a personal PhD supervisor, other conditions and actors play a crucial role in the students' development as researchers. Taking a PhD course to improve some skills is not enough to develop new behaviour and internalize it. This process needs full attention from all relevant parties. So in this course, we focus on the themes that are possible to influence.

Participation in the UDTU course has provided me with a set of tools and a thorough understanding of how different teaching methods can give different outcome in terms of learning. Based on my teaching experience, I must conclude that in the future I will try to integrate more examples, preferably some that they have all witnessed during the course. In relation to the new session that we are in the process of designing, I hope to embrace more active learning, relevant examples and exercises.

The course has also provided me with new colleagues and peers, new learning on styles, small ideas that make a big difference (feedback persons, pre-test, small test, change of focus), my personal tool box, and a greater understanding of how people learn, all of which I am very grateful for and find very useful. My future challenge in this course is to ensure that all students feel included, and secondly, to make my peers at the department more aware of the course’s importance.

10. Final reflections/ improvements for the future

The course's overall idea combined with the PhD student's situation make it clear that this course as well as the teaching session on Mixed Methods Research are justified. The learning leaps are evident, the feedback is positive, and the evaluations are very good, between 3.5 and 4. However, based on the comments received from students and colleagues, as well as the rumours we hear about the course, it is clear that there still is room for improvement.

Since the course was first held, it has been our intention to model the course continuously on the basis of the needs of the students. These can be needs we have identified, such as mixed research, or other needs that have been expressed explicitly. Regarding the latter, some of our students have made it clear that they appreciate the course but find it difficult to see its relevance.

We have therefore decided to introduce a new teaching session that focuses directly on the different research approaches at the department, and we have tried to formulate the learning objectives and core elements. The subject of the session is system construction and understanding domains.

It has also become clear that this course is being met with some resistance and lack of motivation for several reasons. First, the course is mandatory, but it can seem to be an unnecessary or annoying interruption. Some students, it seems, would rather spend their time on courses they have chosen themselves and their research. Second, since the course only gives 2½ points, they may feel that they should just 'get it over with and get back to work'. As teachers responsible for the course, we face a challenge here in order to make it clear that the course is relevant for all the participants despite their research topic, and that by participating actively, their learning process and outcome can actually improve the quality of their own research. Here, I find that the supervisors play an important role and would thus appreciate the supervisors' support for the course by express clearly its importance and relevance. Third, the themes and subjects presented can be difficult to comprehend and can seem very abstract and irrelevant.

We assume that the PhD students are intellectually curious, and that as part of a reflected research environment, they can understand the meaning and usefulness of the course. But having said this, it is important to acknowledge that the students' expectations also vary a lot, thus making it difficult to meet them all. As a consequence, we have chosen to deal with issues and themes on which we have influence. The rest we leave to the supervisor and the student's personal research network and environment. In practice, we try to cover the various topics described above. We are also planning to involve the supervisors in the course, and in addition, department management has stressed the importance of supporting the students' participation.

Finally, we aim continuously to keep a sharp focus on the relevance of the course in relation to the research performed at the department. If the course, learning objectives, content etc. are not aligned with the research fields and environments at the department, it will be difficult for participants to use what they have learned, and they will probably lack motivation.

11. Final remarks

I hope that this report provides some ideas and inspiration regarding how dialogue-based teaching can be carried out in a PhD course, and also how an introductory PhD course can be designed. If any questions arise, you are welcome to contact me at chip@man.dtu.dk

Sincerely,
Christine Ipsen, Assistant Professor
Work, Technology and Organization Section
DTU Management Engineering

Appendix 1

Introduction to the course 42702 "Research and PhD Studies at DTU MANAGEMENT ENGINEERING"

Course introduction (Spring 2010)

This note contains the following information about
the PhD course: Research and PhD Studies
at DTU MANAGEMENT ENGINEERING

- Course description
- Overview of course design
- An overview of each lesson
- Course curriculum
- Introduction to written assignment

42702 Research and PhD Studies at DTU Management

Type:	PhD Course
Language:	English
ECTS Points:	2.5
Time	4 days
Method of instruction	Lectures, presentations by students and discussion. Written assignment.
Curriculum	Collins, J. & Hussey, R.: *Business Research: A practical guide*. 2.edt. Palgrave, 2003. Chapters 1-5: Read for Day 2 and 3. Chapters 6-10: Self-study. The chapters provide an overview of various methods to be used in research of technological and social systems. Gibbons et al. (1994): *The New Production of Knowledge - The Dynamics of Science and Research in Contemporary Society.* Safe Publications.* Introduction Chapter 1: Evolution of Knowledge Production Nowotny et al.(2003): *"Mode 2" Revisited: The New Production of Knowledge.** Booth, W C, Colomb, G G, Williams, J M: "*The Craft of Research*". Chicago University Press, Chapters 7, 8, 9 & 10. Philips, E M & Pugh, D S: *"How to get a PhD – A handbook for students and their supervisors.*" Open University Press. Chapter 8. "How to manage you supervisor" Per L. Jensen: *"Human factors in the planning of production"** * See CampusNet
Qualified prerequisites	The course is offered to all new PhD students at DTU Management.
Evaluation	At the end of the course, the students are evaluated on the basis of the written assignment and participation in the scientific discussions. It is also expected that students participate in more than 80 percent of the scheduled plan.
Assessment	Individual assessment based on passed / not passed
Aim of the course	The aim of the course is to introduce the PhD students at DTU Management to (scientific) research in relation to studies of technology and social systems, and to some of the general challenges they will face during their PhD study. PhD students who have followed this course will be able to: Identify basic steps in scientific work Identify and choose basic approaches to scientific studies Apply basic tools in scientific work Identify and choose among different methods in scientific studies Make a peer review within the field of socio-technical studies Participate in establishing research strategies in the light of present discussion of research policy Establish a career strategy based on the PhD study
Course content & topics	The following themes are addressed: Philosophy of Science – Science of Engineering (special characteristics of engineering science) Methodology and tools in research Development of the competencies needed

	Career patterns for a PhD The research process and the process of a PhD-study Management of literature Trends in research policy This course, in combination with the obligatory courses in Teaching and Learning for PhD students at DTU Management, aims to train the participants for central tasks related to working in academia.
Remarks	The course is mandatory for all PhD students at DTU Management within their first ½ year of the PhD study.
Course responsible	Per Langaa Jensen, 424, 010 (+45) 4525 6031Christine Ipsen, 425, 4525 6014, chip@man.dtu.dk
Web-page	www.man.dtu.dk

DAY	SUBJECTS
Tuesday 13.04.10	**Research at DTU Management** **Philosophy of Science (Part 1)** **Information Retrieval**
Wednesday 14.04.10	**Philosophy of Science (Part 2)** **Mixed Methods Research** **Evaluating Research** **Literature Management**
Thursday 15.04.10	**The PhD Rollercoaster** **Cooperation in Research** **Science of Engineering** **Introduction to the Final Assignment**
Friday 16.04.10	**Writing a Paper** **PhD Careers** **Research at DTU** **Course Evaluation**

1st Day	Tuesday 13th April 2010
Plan for the day	
9.00	**Welcome** By Head of Department Per Langaa Jensen and Assistant Professor Christine Ipsen Introduction to the course: being a PhD student at DTU Management and information about the PhD programme. Presentation of the participants and the department. Pre-test: How much do you know about the themes?
10.00	**Philosophy of Science (Part 1)** By Head of Department Per L. Jensen This morning there will be an introduction to the main types of research, research paradigms and key methodologies associated with the paradigms. It should enable you to understand and clarify your own position, your type of research etc. **Literature:** Collins, J. & Hussey, R.: *Business Research: A practical guide.* 2.edt. Palgrave, 2003 Chapters 1-5: Read for days 2 and 3. Chapters 6-10: Self-study
12.00	Lunch
12.45	**Research at DTU Management** Presented by two researchers from DTU management Two researchers will present various and typical research questions, their theoretical foundation, methodology and their relation to the practice of engineering. Researchers: David Pisinger (Operation Research) Torben Elgaard Jensen (Innovation og Bæredygtighed)
14.15	**Break**
14.30	**Information retrieval - Approaches and methods** By Librarian Henning Kristensen, DTU Library This session will introduce you to systematic information retrieval, which is highly relevant in all research activities. NB!! Please remember to bring you computer, as there will be some practical exercises. **Literature:** Chapter 4 in *Business Research*. **Feedback by two participants**

2nd Day	Wednesday 14th April 2010
Plan for the day	
9.00	**Working with your personal toolbox** You will spend 15 minutes working with your personal toolbox. It contains theories, methods, your realizations, notes etc., which you find valuable for your further work.
9.15	**Philosophy of Science (Part 2)** By Head of Department Per Langaa Jensen Having decided on your research paradigm and defined the theoretical scope and topic, you are now to determine your research design. This afternoon you are to reflect on how your project relates to the presented models, tools, methods and theories. Your reflections are to be used in the final exercise. **Literature**: Collins, J. & Hussey, R.: *Business Research: A practical guide*. 2.edt. Palgrave, 2003. Chapter 5: Determining the research design.
11.00	**Mixed Methods Research** By Christine Ipsen, Assistant Professor (TOA) Several researches at DTU Management work with mixed methods research. In this session, you will be introduced to this paradigm.
12.00	Lunch
12.45	**Evaluating research – Writing a paper** By Erling Havn, Associate Professor and Head of PhDSchool, (TOA). The purpose of this session is to obtain an understanding of the criteria that can be used when writing a scientific paper.
14.15	**Break**
14.30	**Managing References – Principles and tools** By Henning Kristensen, DTU Library This afternoon there will be discussion and introduction to the use of various tools for managing your references, such as RefWorks, Reference Manager, Endnote and Bookends and BibTeX. Focus on RefWorks. NB! Please remember to bring you computer – it's essential for performing the exercises.
	Feedback by two participants

3rd Day	Thursday 15th April 2010
Plan for the day	
9.00	**The PhD rollercoaster** This morning you will be introduced to some of the aspects of being a PhD student. Two of our PhD students will present what it is like to be in the middle of a PhD project. It will be an informal session, and a small breakfast will be served. Our guests this morning will be Anne Nygaard Tanner (ISF) and Kirsten Galamba (PLB)
10.30	**Cooperation in Research: The relation between student and supervisor** Introduction to relevant issues regarding the all-important student-supervisor relationship. Presented by PhD supervisors Susanne Balslev Nielsen (PLB) and Ole Broberg (TOA) **Literature**: "How to manage you supervisor" Chapter 8 in *How to get a PhD*.
11.15	**Coaching possibilities at DTU Management** Mirjam Godskesen is one of our two coaches at DTU Management. She will present some results from a development project focusing on PhD coaching,which addresses some of the relevant themes regarding being a PhD student. She will also discuss when and how to use coaching at the department.
12.00	Lunch
12.45	**Science of Engineering** By Anders Buch, IDA & DTU Management This session will introduce you to two different approaches to and understanding of science. **Literature:** Gibbons et al.: *The New Production of Knowledge - The Dynamics of Science and Research in Contemporary Society*. Safe Publications, 1994. (Chapter 1 & 2) Nowotny et al. (2003): "Mode 2" Revisited: The New Production of Knowledge.
14.00	**Group work** The rest of the afternoon you will have time to continue work on the final exercise.
	Feedback by two participants

4th Day	Friday 16th April
Plan for the day	
9.00	**Working with your personal toolbox** You will spend 15 minutes working with you personal toolbox. It contains theories, methods, your realizations, notes etc. that you find valuable for your future work.
9.15	**Evaluating research – Assessing a paper** By Christine Ipsen, Assistant Professor The purpose of this session is to obtain an understanding of the criteria that are used/can be used when assessing a scientific paper. Before the course, we handed out an article. After reading that article, it is now your job to assess it and explain which criteria you have used in the assessment. At the end of the session, the identified criteria will be discussed in plenum. **Literature:** Per L. Jensen: "Human factors in the planning of production" (See CampusNet) Booth, W C, Colomb, G G, Williams, J M: *The Craft of Research*. Chicago University Press, Chapters 7, 8, 9 & 10.
10.15	**Drafting your first paper** During this session you are to draft the outline of your first paper – from the idea to the structure. If you do not have an idea for your first paper – you can use your master thesis for inspiration.
11.00	**Writing a PhD - based on articles** Rikke Seim, Consultant and PhD, will present her experiences from her PhD study, for which she has written three articles and a summery.
11.30	**Summing up**
12.00	Lunch
12.45	**Research at DTU Management** By Per Dannemand Andersen, Head of Research Council at DTU Management In addition to qualifying you, your PhD study is an important contribution to the research activities at DTU Management. It is therefore important that you can see your activities within the institutional framework for research at the university and in the context of DTU Management. This presentation will also introduce you to the research activities and present trends in the research policy at the department.
14.30	**Assignment and Evaluation** By Christine Ipsen & Per Langaa Jensen On the 17 May 2010, you are to forward 5-10 pages in which you integrate the models, theories, tools, methods etc. presented in the course with your study. Describe how your possibilities and your own situation and project can contribute to the department's research strategy, as well as your expectations for your PhD study. Finally, you should include a well-described outline of your first article in which you integrate the concepts presented. The evaluation criteria will be your ability to use the presented concepts in relation to your own project and the level of consistency.

The purpose of this report is to inspire other peers at DTU to carry out dialogue-based teaching by sharing ideas and inspiration from the PhD course "Research and PhD Studies at DTU Management".

The report outlines reflections and the design process of the PhD course "Research and PhD Studies at DTU Management Engineering", and in particular a teaching session on "Mixed Methods Research", using a dialogue-based teaching approach. The course design is based on the assumption that the PhD students are intellectually curious, and that as part of a reflected research environment, they can understand the meaning and usefulness of the course.

The report also describes the use and benefits of using peer coaching in the planning process of a teaching session. And finally it gives insight into the design process, teaching experience, and some related reflections. It is hoped that all in all it can serve as inspiration in the development of new PhD student courses at DTU as well as more active teaching.

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